

Please replace the paragraph beginning at page 1, line 13, with the following rewritten paragraph:

A1
The optical connector has a sleeve having a light-leading path with a constant diameter along an optical axis. Therefore, when a light-receiving surface of the receiving module is smaller than the light-emitting surface of the sleeve, a part of signal light transmitted through the optical fiber cannot be received by the receiving module, thereby lowering the transmission efficiency.

Please replace the paragraph beginning at page 1, line 17, with the following rewritten paragraph:

When a light emitting diode (LED) is used as a transmitting module, the light emitted by the light emitting diode diffuses, and a part of the light emitted by the light emitting diode cannot enter the light-leading path of the sleeve.

Please replace the paragraph beginning at page 1, line 15, through page 2, line 3 with the following rewritten paragraph:

A2
The receptacle 103 has a housing 107 of synthetic resin, transmitting and receiving modules 104 and a pair of sleeves 101. The housing 107 is formed in a box-shape and has a pair of accommodating chambers 108 opening in the external wall. And, the housing 107 couples with the optical plug shown in FIG.11.

Please replace the paragraph beginning at page 2, line 4, with the following rewritten paragraph:

A2 The transmitting and receiving modules 104 are accommodated in the respective chambers 108. A pair of sleeves 101 are installed in the housing 107. The sleeve 101 has a light-leading path 126 of frusto-conical shape.

Please replace the paragraph beginning at page 2, line 15, with the following rewritten paragraph:

A3 The optical plug has a pair of optical fibers, a pair of ferrules, and the plug housing. The pair of optical fibers are arranged in parallel. Each ferrule covers the optical fiber in a state of the end face of the optical fiber being exposed. The plug housing accommodates the ferrule and couples within the housing.

Please replace the paragraph beginning at page 3, line 1, with the following rewritten paragraph:

A4 With respect to the above prior art optical connector 102, however, since the sleeve 101 is accommodated in the housing 107 in a state that the light-leading path 126 reduces its diameter toward the transmitting or receiving module 104, it is difficult to secure the sleeve 101 in the housing 107 such that the sleeve 101 can optically connect the optical fibers and the respective transmitting and receiving modules 104.

Please replace the paragraph beginning at page 3, line 7, with the following rewritten paragraph:

A4 The above structure requires increased man-hours for its assembly work thereby increasing the cost. And also, since the transmitting and receiving modules 104 can not necessarily be optically secured with the optical fibers, the transmission efficiency of the signal light is lowered. Further, the sleeve 101 slips off to an extent of releasing the optical connection.

Please replace the paragraph beginning at page 3, line 18, through page 4, line 2 with the following rewritten paragraph:

A5 In order to achieve the above object, as a first aspect of the present invention, a sleeve arranged between an optical fiber and a transmitting or receiving module for optically connecting the optical fiber and the transmitting or receiving module comprises: a light-leading path being in a frusto-conical shape having a small-diameter end face facing the transmitting or receiving module; a peripheral projecting portion projecting in a radial direction from another end portion, being on a side of the optical fiber, of the light-leading path; and an outer tube portion extending in an optical axis direction of the light-leading path from a peripheral portion of the peripheral projecting portion toward the small-diameter end face while covering an entire length of the light-leading path.

Please replace the paragraph beginning at page 4, line 7, with the following rewritten paragraph:

A6
As a third aspect of the present invention, based on the second aspect, an outside diameter of the outer tube portion is substantially uniform over an entire length of the light-leading path.

Please replace the paragraph beginning at page 4, line 10, with the following rewritten paragraph:

As a fourth aspect of the present invention, based on the first aspect, the outer tube portion has a flange projecting annularly in a radial direction from a peripheral surface thereof.

Please replace the paragraph beginning at page 6, line 16, with the following rewritten paragraph:

M
(3) Because the outside diameter of the outer tube portion is uniform in a longitudinal direction thereof, the sleeve can be more securely positioned only by accommodating it in the mediating pipe of the housing, thereby improving productivity of the optical connector with the sleeve, reducing the cost thereof, and improving the transmission efficiency of the optical connector with the sleeve.

Please replace the paragraph beginning at page 7, line 2, with the following rewritten paragraph:

A8
(6) Because the lens does not project beyond the outer tube portion, the lens can be protected by the outer tube portion, thereby facilitating the production management.

Please replace the paragraph beginning at page 8, line 6, with the following rewritten paragraph:

AG FIG.1 is a plan view showing an optical connector having an embodiment of a sleeve in accordance with the present invention;

FIG.2 is a sectional view of the optical connector shown in FIG.1;

FIG.3 is a side view showing an embodiment of the sleeve in accordance with the present invention;

FIG.4 is a sectional view of the sleeve, taken along a line IV-IV in FIG.3;

FIG.5 is an end view of the sleeve, taken from an arrow V in FIG.3;

FIG.6 is an end view of the sleeve, taken from an arrow VI in FIG.3;

FIG.7 is a sectional view showing a state of transmitting the light from an optical fiber to a receiving device through the sleeve shown in FIG.3;

FIG.8 is a sectional view showing a state of transmitting the light from a transmitting device to an optical fiber through the sleeve shown in FIG.3;

FIG.9 is a diagram showing a state of transmitting the light shown in FIG.8, which light should be conventionally larger than the critical angle;

FIG.10 is a sectional view showing a part of a metal mold unit used for molding the sleeve shown in FIG.3; and

FIG.11 is an exploded perspective view showing a structure of a prior art optical connector.

Please replace the paragraph beginning at page 9, line 15, with the following rewritten paragraph:

A10
The ferrule 15 integrally has a base end portion 15a most remote from the above end face 6a of the optical fiber 6, a circular ring portion 15b projecting in a radial direction from the base end portion's end nearer the end face 6a, a middle portion 15c continuing from a face of the circular ring portion 15b and having a diameter smaller than that of the above base end portion 15a, and a front end portion 15d continuing from the end of the middle portion 15c and having a diameter smaller than that of the middle portion 15c.

Please replace the paragraph beginning at page 12, line 3, with the following rewritten paragraph:

A11
The sleeve 1 is formed, for example, by the injection molding with synthetic resin such as Polymethylmethacrylate (PMMA), transparent polycarbonate (PC), or Cycloolefin. The sleeve 1, as shown in FIG.3 to FIG.6, integrally has a light-leading path 26 in a frusto-conical shape, a peripheral projecting portion 27, an outer tube portion 28, and a flange 31.

Please replace the paragraph beginning at page 12, line 17, with the following rewritten paragraph:

A12
The lens 35 is formed convexly with a defined radius of curvature toward the optical fiber 6 from the end face 32. In the present embodiment, the lens 35 is a spherical one. This lens 35 attains an efficient transmission of the signal light. And, the lens 35 does not project beyond an end face 33b of the outer tube portion 28.

Please replace the paragraph beginning at page 13, line 1, with the following rewritten paragraph:

A13
The outer tube portion 28 extends from the peripheral portion of the peripheral projecting portion 27 toward the end face 29. The outer tube portion 28 covers the entire light-leading path 26 along the optical axis P. An end face 33a of the outer tube portion 28 is generally flush with the above end face 29. The outside diameter of the outer tube portion 28 is the same over the entire length thereof. The center line of the outer tube portion 28 aligns with the optical axis P. The light-leading path 26, the peripheral projecting portion 27, and the outer tube portion 28 are formed coaxially.

Please replace the paragraph beginning at page 13, line 10, with the following rewritten paragraph:

A14
The flange 31 is circular and projects radially from the peripheral surface of the outer tube portion 28. The flange 31 is provided on a generally longitudinal center of the outer tube portion 28

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AM coaxially around the optical axis P. The flange 31 is formed coaxially with the light-leading path 26,
the peripheral projecting portion 27, and the outer tube portion 28.
